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(54) **ION-BEAM-NEUTRALIZING DEVICE**

perform a stable implantation efficiently.

(57) Abstract:

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**PURPOSE:** To perform neutralization of a positive ion beam efficiently at a low temperature by placing a secondary electron amplifier tube around a Faraday cage covering an ion beam and pouring secondary electrons discharged from the amplifier tube into a positive ion beam.

**CONSTITUTION:** Gas containing an element such as phosphorus is supplied to an ion source 2 to produce an ion beam 3 which is then separated into specific kinds of ions by means of a magnet 4. The thus obtained specific kinds of ions by being passed through a slit 6 are formed into an implantation ion beam 3' and ion implantation is performed on a wafer 9 placed on the rotary disk 8 of an implantation chamber 7. A filament 10, a liberal electrode 15 and a multi-staged secondary electron amplifier tube 18 are installed outside a Faraday cage 13 covering the ion beam 3' so as to neutralize secondary electrons 12' of the amplifier tube 18 by pouring them into the ion beam 3', thereby extinguishing positive charges existing on the surface of the wafer 9. Therefore it is possible to obtain large secondary electrons with a small electric power and to

